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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/663,769	09/17/2003	Zhonghua Zhou	047297-0138	3844

22428 7590 03/29/2005

FOLEY AND LARDNER  
SUITE 500  
3000 K STREET NW  
WASHINGTON, DC 20007

EXAMINER
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LE, HOA T

ART UNIT	PAPER NUMBER
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1773

DATE MAILED: 03/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

BCJ

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/663,769	ZHOU ET AL	
	<b>Examiner</b>	<b>Art Unit</b>	
	H. T. Le	1773	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>Sept. &amp; Nov. 2003</u> . | 6) <input type="checkbox"/> Other: ____.  |

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. Claims 1-27 are rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Two critical conditions to the practice of the invention (which will be discussed below), but not included in the claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

As evident throughout the specification, the purpose of the claimed invention is to provide titanium dioxide particles functioning as a photocatalyst; that is, titanium dioxide particles that fail to exhibit sufficient photocatalytic activity are not titanium dioxide particles according to Applicant's invention.

It is stated in the specification that "a sufficient photocatalytic activity cannot be obtained" when: (1) the content of the titanium dioxide component in the titanium dioxide particle is less than 80% by weight and (2) the concentration of doping nitrogen element is less than 700 ppm by weight. See instant specification, page 14, 4<sup>th</sup> full paragraph and page 15, 4<sup>th</sup> full paragraph, respectively.

In other words, the titanium dioxide particles that are enabled by the instant disclosure are those that meet two requirements: (1) the content of TiO<sub>2</sub> being at least 80 wt% and (2) doping nitrogen content of at least 700 ppm by wt.. Therefore, claims 1-3 and 5-27, which fail to include those two critical limitations, are deemed broader than the scope of the enabling disclosure.

*Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 21, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morikawa et al (US 6,743,749).

Morikawa et al teach a method of doping nitrogen to titanium dioxide by thermally treating titanium dioxide under a nitrogen-containing gas at 550 °C (see col. 5, lines 54-64). Thus the doping method and the starting material for doping taught by Morikawa are identical to those claimed. The only difference is the shape of the titanium dioxide: film versus particle. However, different shapes of titanium dioxide do not require different doping gas or doping temperature as long as the material to be doped remains the same (titanium dioxide). Thus, the doping method taught by Morikawa is equally applicable for various physical structures of titanium dioxide. Therefore, one having ordinary skill in the art would have found it obvious to apply the doping process taught by Morikawa on titanium dioxide particles if doped particulate titanium dioxide is desired.

4. References not relied upon are cited as art of interest.

*Information Disclosure Statement*

5. Applicants are requested to resubmit the information disclosure statement filed February 22, 2005 along with documents cited therein because the Office failed to capture the documents to the file. Any inconvenience caused by this failure is regretted, and Applicant's compliance to this request is greatly appreciated.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. T. Le whose telephone number is 571-272-1511. The examiner can normally be reached on 10:00 a.m. to 6:30 p.m., Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



H. T. Le  
Primary Examiner  
Art Unit 1773